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**CONFIDENTIAL**  
**ATTORNEY-CLIENT PRIVILEGED**

Oberthur Card Systems, S.A.  
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805 Third Avenue  
New York, NY 10022  
Attn: James Jacobs, Esq.

Re: ***Leighton U.S. Patent Nos. 5,817,207, 6,036,099, 6,214,155, and 6,154,367***

Pursuant to your request we have studied U.S. Patent Nos. 5,817,207 ("the '207 patent"), 6,036,099 ("the '099 patent") 6,214,155, ("the '155 patent) and 6,154,367 ("the '367 patent")(referred to collectively as "the Leighton patents"), to assess whether they are valid. As part of our assessment, we studied the prosecution history of each patent. Copies of the Leighton patents and their corresponding prosecution histories are attached in the accompanying appendix. I understand you have copies of the prosecution histories so I am not including them in the appendix.

We also studied Japanese unexamined patent application publication H6-176214 ("the Japanese application"), U.S. Patent No. 5,399,223 to Vogt ("the Vogt patent"), UK Patent Application No. 2,225,283 ("the U.K. application"), U.S. Patent No. 5,519,201 to Templeton, Jr. et al. ("the Templeton patent"), U.S. Patent No. 4,897,533 to Lyszczarz



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("the Lyszczarz patent") and published European Patent Application No. 0616906 ("the EP application"). Copies of these references are also enclosed in the appendix.

**I. My Background**

I have prepared this opinion having an extensive background in the field of patent law. I am a partner in the law firm of Seyfarth Shaw LLP, 55 East Monroe Street, Suite 4200, Chicago, Illinois 60603. I hold a Bachelor of Science degree in Electrical Engineering from the University of Illinois and a Juris Doctor degree with Honors from the George Washington Law Center. I was Assistant Patent Editor of the George Washington Law Review during my tenure at George Washington Law Center. I have been admitted to practice before the courts of the State of Illinois since 1964. I am also admitted to practice before various district courts throughout the United States, various federal courts of appeals, including the United States Court of Appeals for the Federal Circuit, and the United States Supreme Court. I am registered to practice before the United States Patent and Trademark Office.

I am a former United States Patent Examiner and have had over 40 years of experience as an attorney in the field of patent law. As a Patent Examiner, I examined hundreds of patent applications. As a patent attorney since 1964, I participated in the preparation and prosecution of hundreds of patent applications and have written dozens of formal opinions of counsel. I have handled numerous Patent Office appeal, interference, reissue, and reexamination proceedings. I have been lead counsel in litigation involving numerous patents, have counseled clients with respect to the issues of infringement and

validity, have negotiated numerous patent licenses, have been an expert witness in many patent infringement suits, and have given numerous lectures on various patent law topics.

I have been qualified and have testified as a patent expert at trials in the following federal courts: Northern District of Illinois, District of Arizona, Northern District of California, District of New Jersey, Southern District of New York, Eastern District of New York, Eastern District of Michigan, District of Delaware, District of Nebraska, and Eastern District of Wisconsin.

## **II. Opinion**

In our opinion, claims 1-17 of the '207 patent, claims 1-16 of the '155 patent, claims 1-16 of the '099 patent, and claims 1-23 of the '367 patent are invalid under 35 U.S.C. §103(a) as being unpatentable over the references cited above. Before providing our analysis, we will discuss the legal principles applicable to our conclusion.

## **III. Presumption of Validity**

A United States patent is presumed valid. 35 U.S.C. §282. The presumption of validity stems from the deference the courts give to the procedures of the United States Patent and Trademark Office. *Applied Materials, Inc. v. Advanced Semiconductor, Inc.*, 98 F.3d 1563, 1569. A patent can only be invalidated through clear and convincing evidence. *Id.* Evidence that was not before the USPTO when awarding the patent is highly relevant. *Id.* Such evidence "does not change the presumption of validity or the standard of proof" but "the burden may be more or less easily carried because of the additional evidence." *Id.* Of the references cited above, only the U.K. application, the Templeton patent, and the Japanese patent were considered by the USPTO, and the USPTO only considered it with respect to the '367 patent.

#### IV. Claim Construction

The first step in determining the validity of a claim is claim construction. *Akamai Technologies, Inc. v. Cable & Wireless Internet Services, Inc.*, 68 USPQ 2d 1186, 1190 (Fed. Cir. 2003); *Cybor Corp. v. FAS Technologies, Inc.*, 138 F.3d 1448, 1456 (Fed. Cir. 1998). The construction of the patent claims, including terms of art within the patent claims, is a matter of law for a court to decide. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996). To interpret the claims of a patent, the claim is construed in light of the plain meaning of the words of the claim, other claims in the patent, the patent itself, and the prosecution history. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir. 1995) *affirmed*, 517 U.S. 370 (1996). So long as the patentee has defined the terms in the claim, the patentee may be his or her own lexicographer. *Fonor Corp. v. Johnson & Johnson*, 821 F.2d 627 (Fed. Cir. 1986). However, a claim must be read in accordance with normal English grammar. *In re Hyatt*, 708 F.2d 712 (Fed. Cir. 1983). Unless the patentee has shown an express attempt to provide a novel meaning to the terms of a claim, the claim terms take on their ordinary meaning. *York Products, Inc. v. Central Tractor Farm*, 99 F.3d 1568 (Fed. Cir. 1996).

In preparing this opinion, our claim construction is such that we have interpreted the claims to be as favorable as possible to the patentee, Leighton.

#### V. Comparison to Prior Art

The second step in determining whether a claim is invalid, is to compare the claim to the prior art. Where a single prior art reference discloses each and every limitation of the claim, either expressly or inherently, the claim is invalid as anticipated under 35 U.S.C. §102. *Akamai Technologies, Inc. v. Cable & Wireless Internet Services, Inc.*, 68 USPQ 2d

1186, 1190 (Fed. Cir. 2003); *Crown Operations International, Ltd. V. Solutia Inc.*, 289 F.3d 1367, 1375 (Fed. Cir. 2002); *Scripps Clinic & Research Foundation v. Genetech, Inc.*, 927 F.2d 1565, 1576-77 (Fed. Cir. 1991). If all of the limitations of a claim are not found in a single prior art reference, the claim might still be invalid as obvious. 35 U.S.C. §103.

In contrast to anticipation, which is a question solely of fact, obviousness is a question of law based on underlying facts. *Beckson Marine, Inc. v. NFM, Inc.*, 292 F.3d 718, 722 (Fed.Cir. 2002).

Invalidity due to obviousness occurs if the differences between the subject matter of a patent claim and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person of ordinary skill in the art. *Id.*; 35 U.S.C. §103(a).

Four factual inquiries are relevant when making a determination of obviousness. (1) the scope and the content of the prior art; (2) the differences between the prior art and the claim(s) at issue; (3) the level of ordinary skill in the art; and (4) secondary considerations of non-obviousness. *Graham v. John Deere*, 383 U.S. 1, 17 (1966). After the inquiries, one must determine whether obviousness exists. "Whether a patent claim is obvious under Section 103 depends upon ... how the factual answers meld into the legal conclusion of obviousness *vel non*." *McKinley v. Franklin Sports*, 262 F.3d 1339, 1351.

In our opinion, the level of ordinary skill in the art is a college graduate with an engineering degree and two years of experience in lamination of transaction cards.

The procedural tool used by the USPTO and the courts when evaluating obviousness is the legal concept of *prima facie* obviousness. Manual of Patent Examining

Procedure (MPEP), 8<sup>th</sup> Edition, Rev. 2, §142; *Ashland Oil Inc. v. Delta Resins and Refractories, Inc.*, 776 F.2d 281, 291 (Fed. Cir. 1985). To establish *prima facie* obviousness of a claim, there must be (1) a teaching, suggestion, or motivation to modify a reference or combine references. MPEP §2143.01, (2) a reasonable expectation of success (in making the modification or combining the references). MPEP §2143.02, and (3) all claim limitations must be taught by the references. MPEP §2143.03.

Obviousness often arises in the context of a single prior art reference that discloses some, but not all, of the limitations of a claim at issue. Applying the above principles, such a claim is *prima facie* obvious if the missing limitations exist in the prior art and there is a teaching, suggestion or motivation in the prior art that would compel one of ordinary skill in the art to modify the reference to include missing limitations, and one of ordinary skill in the art could reasonably expect the modification to succeed.

The decision maker commonly establishes that the missing limitations exist in the prior art by identifying other prior art references that teach them. Courts have also ruled that certain differences between the claim and the prior art are *per se* obvious. MPEP §2144.04. For instance, aesthetic design changes, changes in size proportion, optimization of a result - effective variable, such as temperature and routine experimentation within prior art conditions, have been found obvious on their face. *Id.* Where a limitation is shown to be critical, however, legal precedent is not an appropriate sole rationale for a conclusion of obviousness. *Id.*

After *prima facie* obviousness is found, a patentee is entitled to provide rebuttal evidence supporting non-obviousness. *Ashland Oil*, 776 F.2d 281, 291. Obviously, we are

not in a position to evaluate rebuttal evidence from Leighton, but we can examine the record and weigh evidence supporting a conclusion of non-obviousness it in our conclusion.

**VI. The Leighton Patents**

The Leighton patents relate to processes for making smart cards. A smart card is a thin plastic card with embedded electronics. Smart cards are used as credit cards, ID cards, debit cards, and the like. The electronics within a smart card generally performs a certain function, such as storing the value of a user's bank account and sending the information to a card reader in an ATM machine.

There are two types of smart cards: smart cards that send information by contacting the card with a card reader and smart cards that send information through electromagnetic coupling of the card to the card reader. The former are called contact cards. The latter are called contactless cards. Cards that can do both are called dual use cards. The '207 and '155 patents recite processes for making contactless smart cards. The '099 and '367 patents recite processes for making dual use smart cards.

The '155 patent is a continuation of the '207 patent. This means that the '207 and '155 patents share an effective filing date and are identical with the exception of the claims. The '367 patent is a continuation of the '099 patent. Thus, the '099 and '367 patents share an effective filing date and are identical with the exception of the claims. The '207 and '155 patents as a group are also similar to the '099 and '367 patents in that the '099 patent is a continuation-in-part of the '207 patent. This means that the '099 and '367 patents disclose the same subject matter as the '207 and '155 patents and, in



addition, disclose additional subject matter added at the time of filing of the '099 patent. The '099 and '367 patents share the effective filing date of the '207 and '155 patents with respect to the common subject matter, but not the additional subject matter. The additional subject matter relates to process steps for making dual use cards.

The Leighton patents all claim priority to provisional application 60/005,865 which was filed on October 17, 1995. Thus, any common subject matter between the Leighton patents and the provisional application will have an effective filing date of October 17, 1995. In addition, the '099 and '367 patents claim priority to provisional application 60/024,255 filed August 21, 1996. Therefore, common subject matter between this provisional application and the '099 and '367 applications will have an effective filing date of August 21, 1996. We have not had to make a determination whether there is any common subject matter between the provisional applications and the Leighton patent because all of the references we cite in support of our opinion qualify as prior art with respect to an October 17, 1995 effective filing date.

**A. "The '207 Patent"**

The '207 patent claims are set forth as follows.

1. A process for incorporating at least one electronic element in the manufacture of a plastic card, comprising the steps of:

(a) providing first and second plastic core sheets;

(b) positioning said at least one electronic element in the absence of a non-electronic carrier directly between said first and second plastic core sheets to form a core, said plastic core sheets defining a pair of inner and outer surfaces of said core;

(c) positioning said core in a laminator apparatus, and subjecting said core to a heat and pressure cycle, said heat and pressure



cycle comprising the steps of:

- (i) heating said core for a first period of time;
- (ii) applying a first pressure to said core for a second period of time such that said at least one electronic element is encapsulated by said core;
- (iii) cooling said core while applying a second pressure to said core,
- (d) coating at least one of said outer surfaces of said core with a layer of ink; and
- (e) applying a layer of overlamine film to at least one of said outer surfaces of said core.

2. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said laminator apparatus has first and second laminating plates, at least one of said first and second laminating plates having a matte finish for creating a textured surface on at least one of said outer surfaces of said core.

3. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 2, wherein each of said first and second laminating plates has a matte finish for creating said textured surface on both of said outer surfaces of said core.

4. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said first and second plastic core sheets are made from a material selected from the group consisting of polyvinyl chloride, polyester, and acrylonitrile-butadiene-styrene, each of said sheets having a thickness in the range of 0.007 to 0.024 inch.

5. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 4, wherein said first and second plastic core sheets have a thickness of approximately 0.0125 inch.

6. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said second pressure is greater than said first pressure.

7. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 6, wherein said second pressure is at least approximately 25% greater than said first pressure.

8. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said core is heated in step (c)(i) to a temperature in the range of 275.degree. F. to 400.degree. F. and said first period of time is at least five (5) minutes.

9. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said first pressure is approximately 1000 p.s.i. and said second period of time is at least 10 minutes.

10. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said step (d) is carried out utilizing a printing press.

11. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said step (d) is carried out utilizing a coating technique selected from the group consisting of silk screen printing, offset printing, letterpress printing, screen printing, roller coating, spray printing, and litho-printing.

12. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said step (e) of applying a layer of overlamine film comprises the further steps of:

(a) positioning an overlamine film on at least one ink coated surface of said core;

(b) subjecting said core to a second heat and pressure cycle comprising the steps of:

(i) heating said core to a temperature between approximately 175.degree. F. to 300.degree. F. for approximately 10 to 25 minutes;

(ii) applying approximately 1000 p.s.i. pressure to said core; and

(iii) cooling said core to a temperature in the range of approximately 40.degree. F. to 65.degree. F. for approximately 10 to 25 minutes.

13. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said at least one electronic element is a micro-chip and an associated wire antenna.

14. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said at least one electronic element is a micro-chip and an associated circuit board antenna.

15. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said at least one electronic element is a read/write integrated chip and an associated antenna.

16. A hot lamination process for the manufacture of plastic cards, said process comprising the steps of:

(a) providing first and second plastic core sheets;

(b) positioning at least one electronic element in the absence of a non-electronic carrier directly between said first and second plastic core sheets to form a layered core;

(c) positioning said core in a laminator apparatus, and subjecting said core to a heat and pressure cycle, said heat and pressure cycle comprising the steps of:

(i) heating said core in said laminator, in the presence of a minimal first ram pressure, to a temperature which causes controlled flow of said plastic which makes up said first and second plastic core sheets;

(ii) applying a second pressure uniformly across said core for encapsulating said at least one electronic element within said controlled flow plastic;

(iii) subsequently cooling said core in conjunction with the concurrent application of a third pressure uniformly across said core, said core including and upper and lower surfaces;

(d) printing on at least one of said upper and lower surfaces of said core such that a layer of ink is applied to at least a portion of said at least one upper and lower surface of said core.

17. The method as recited in claim 16 wherein said first and second core layers are devoid of any appreciable cutouts.

**1. Prosecution History of the '207 Patent**

The '207 patent has a filing date of October 7, 1996. The application included 22 claims, two of which were independent. Claims 20-22 were later withdrawn subject to a restriction requirement.

On September 8, 1997, the PTO mailed the first Office Action. Claims 1-19 were rejected as being unpatentable under 35 U.S.C. §103 over Hagairi-Tehrani, U.S. Patent No. 4,450,024 ("the Hagairi-Tehrani patent"). In presenting the rejection, the Examiner asserted that the Hagairi-Tehrani patent discloses all of the features in independent claim 1, except "application of a printing layer in the manner recited in the claim". The Examiner concluded, however, that it would be obvious for one of ordinary skill in the art to apply a printing layer to those already present. The Examiner rejected the dependent claims as specifying process parameters well within the skill of a person of ordinary skill in the art.

On January 8, 1998 Leighton filed a response. Claims 6, 9, 10 and 19 were cancelled, claims 1-5, 7-8, 11-18 were amended, and claims 23-24 were added. There were two substantial changes made to the claims. Independent claim 1 was amended to recite "positioning said at least one electronic element in the absence of a non-electronic

carrier between said first and second plastic core sheets [emphasis added]" and to recite "subjecting such core to a heat and pressure cycle" including heating for "a first period of time", "applying a first pressure to said core for a second period of time", and "cooling said core while applying a second pressure to said core".

New independent claim 23 (which issued as claim 16) included similar language to independent claim 1. The main difference being that the first period of heating was specified as being conducted "in the presence of minimal ram pressure", i.e., a period of preheating. In the remarks, Leighton distinguished the claims from Hagairi-Tehrani by explaining that Hagairi-Tehrani requires that "an electronic element be placed in a protective carrier disk (6)" during lamination, whereas the '207 patent claims recite the "absence of a non-electronic carrier". Leighton also argued that although Hagairi-Tehrani describes forming a card by varying pressure and temperature in general, it does not disclose a specific "sequence of steps for lamination of an electronic element of a plastic card."

On April 14, 1998, the Patent Office mailed a Notice of Allowance which contained no reason for allowance. On July 2, 1998, the issue fee was paid and the patent was granted on October 6, 1998.

## **2. Obviousness of '207 Patent**

We do not know the date on which the subject matter of the '207 patent was invented. As stated earlier, the earliest effective filing date of the '207 patent is October 17, 1995. All of the references cited herein qualify as prior art with respect to an October 17, 1995 effective filing date.

The references originate from the same body of technology, namely, the manufacture of plastic cards (e.g. credit cards, identity cards, debit cards, etc.) by laminating multiple sheets of plastic together. Many of the references describe methodologies for embedding electronics within plastic cards. A person of ordinary skill in the art of manufacturing smart cards, such as those described in the Leighton patents, would be familiar with the art described by these references because (1) they describe methods for manufacturing the same products and/or (2) they describe well known techniques (e.g. laminating methods, offset printing, etc.) utilized in the manufacture of these products. We note that none of these references were considered by the USPTO during the examination of the application resulting in the '207 patent.

We believe the evidence is clear and convincing that claims 1 and 4-16 are invalid under 35 U.S.C. § 103(a) as being unpatentable over the Japanese application in view of the Vogt patent, the UK application, and the Lyszczarz patent. Further, we believe the evidence is clear and convincing that claims 2-3 are invalid under 35 U.S.C. § 103(a) as being unpatentable over the Japanese application in view of the Vogt patent, the UK application, the Lyszczarz patent, and the EP application.

The record reflects that the '207 patent issued after the inclusion of the negative limitation "in the absence of a non-electronic carrier between said first and second plastic core sheets" and the recitation of lamination technique involving a heat and pressure cycle including three specific temperature/pressure periods. As set forth below, the references cited herein include these features and establish the *prima facie* obviousness of the

claims. Moreover, the record does not reflect substantial evidence of non-obviousness to rebut this conclusion.

Regarding independent claim 1 and 16, the Japanese application discloses a method of making a contactless ID card including an IC module 11 and a transmission/receiving coil 12 (antenna), i.e., at least one electronic element. (¶ 1). During production, the IC module 11 and antenna 12 are sandwiched between PVC layers 14 (plastic core sheets) to form a core (¶ 7). The PVC layers 14 are located on the surfaces (i.e., no non-electronic carrier) of the IC module 11 and the antenna 12. (¶ 8). A plastic surface material 15 (overlamine film) is placed over the core and the structure is laminated through a heat and pressure cycle (¶ 8).

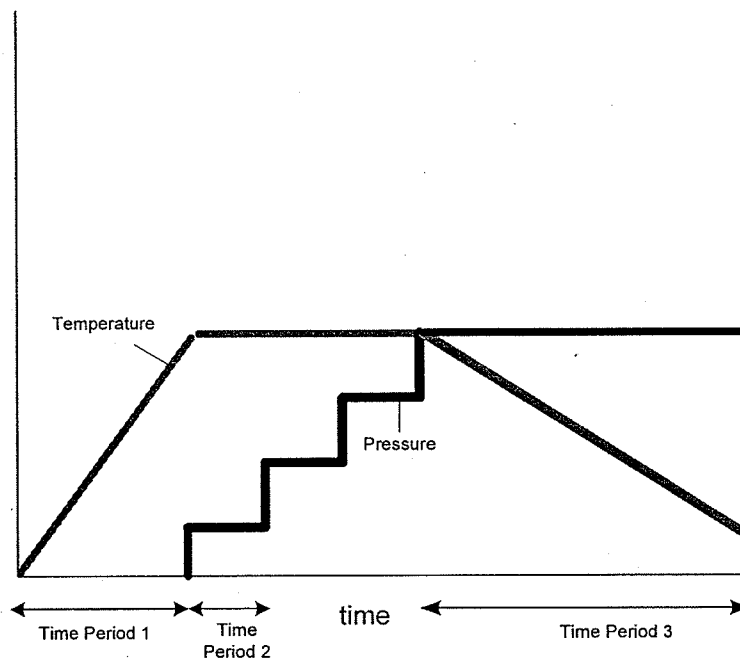
The Japanese application does not explicitly disclose a heating and pressure cycle including a first period of heating with minimal pressure, followed by a second period of heating with pressure. The U.K. application, however, demonstrates that it was well known in the art, at the time of filing, to preheat a lamination press for a first period of time followed by applying pressure for a second period of time (page 11, lines 10-14). One of ordinary skill in the art would include a preheating step in the heat and pressure cycle of the '214 patent, because to do so would conform with standard industry practice (the U.K. application, page 11, lines 5-8).

The Japanese application does not explicitly disclose cooling the core while applying a second pressure. The Vogt patent, however, discloses laminating a plastic card by a method in which a period of pressurized heating is followed by a period of cooling in



which the pressure is changed relative to the pressure exerted during heating (column 8, lines 32-36).

Alternatively the U.K. application discloses preheating a lamination press and then applying pressure in steps followed by cooling after the pressure reaches its highest value (page 11, lines 10-14). As the following graph demonstrates, this also discloses preheating for a period of time, applying a pressure for a second period of time, and then cooling while applying a second pressure.



One of ordinary skill in the art, at the time of filing, would include a period of cooling under a different pressure than that applied during heating (as disclosed in either the Vogt patent or the U.K. application) in the heating/cooling cycle of the '214 application to increase the mechanical stability of the resulting card (the Vogt patent, column 1, lines 50-68).

The Japanese application does not explicitly disclose applying ink, through coating or printing, to the surface of the core. The Lyszczarz patent, however, discloses that it was well known in the card art, at the time of filing, to apply ink to a PVC substrate prior to overlamination (column 4, lines 14-27). One of ordinary skill in the art would be motivated to apply ink to the core of the Japanese application prior to overlamination, because providing a credit card, of which a smart card is an example, with printed information (e.g., identification or instructions) is necessary before the smart card can be commercialized.

Regarding claims 2-3, the Japanese application does not explicitly disclose using lamination plates having a matte finish to laminate a smart card. The EP application, however, establishes that it was well known in the art, at the time of filing, to use embossing plates for lamination (page 6, lines 27-30). One of ordinary skill in the art would be motivated to use embossing plates, of which a matte finish is an example, in the method of the Japanese patent to provide the resulting card with a distinctive appearance.

Regarding claims 4-5, the films 14, 14' disclosed by the Japanese application are made of polyvinylchloride (¶ 8). The Japanese application does not explicitly disclose using sheets having a thickness of .007-.024 inch, or specifically, .0125 of an inch. Nevertheless, the Lyszczarz patent discloses that it was well known in the art, at the time of filing, to make credit cards with a substrate having a thickness of .0265 inch. It is reasonable to infer that a substrate of .0265 inch can be formed by multiple sheets of PVC having a thickness equal to a fraction of the thickness of the substrate. For example a substrate of .0265 inch can be formed of two sheets equal of .01325 inch. Unless there is evidence to the contrary, changes of size or proportion are *per se* obvious. There is no

evidence of record in the '207 patent or file history to suggest that the sheet thickness found in the claims are critical. Therefore, the additional limitations of claims 4-5 are obvious.

Regarding claims 6-7, elementary physics (Hooke's law) dictates that the force exerted by a spring is directly proportional to the distance that the spring is compressed. In the Vogt patent, springs 24 are used to exert force on plates 13-13' in order to compress the core therebetween. The springs 24 are at equilibrium at 6 mm. During heating, springs 24 compress to 3 mm (column 8, lines 18-31). Then, during cooling, springs 24 are compressed a further 3 mm (column 8, lines 32-36), i.e., double the distance during heating. Thus, during cooling, springs 24 exert at least double the force on plates 13-13' than is exerted during the preceding heating step.

Regarding paragraph 8, differences in temperature are obvious unless it can be shown that the temperature is critical. The Lyszczarz patent discloses that a lamination temperature up to 265 degrees is known in the art (column 4, line 8). There is no evidence of record to suggest that the range of 275 degrees to 400 degrees is critical.

Regarding claim 9, the Lyszczarz patent discloses using a pressure of 1000 PSI during a lamination process (column 4, line 33). The duration would be a matter of routine experimentation during prior art conditions.

Regarding claims 10-11, the Lyszczarz patent discloses printing using offset printing (column 3, lines 63). Offset printing utilizes a printing press.

Regarding claim 12, the overlamination process is substantially a repeat of the lamination process. The Lyszczarz patent discloses overlaminating after printing (column

4, lines 25-27). It would be obvious of one of ordinary skill in the art to use the same procedure for overlaminating as used in laminating.

Regarding claims 13-15, the Japanese application discloses embedding an IC module antenna in a plastic card (¶6). One of ordinary skill in the art would recognize that the microchips and antennas of claims 13-15 as potential embodiments of an IC module and antenna. Therefore, the limitations of claims 13-15 are obvious.

Regarding claim 17, the Japanese application discloses a card with no appreciable cut outs (Figs. 1-4).

**B. The '155 Patent**

The '155 patent is a continuation of the '207 patent. Apart from differences to the claims, which will be discussed herein, the patents are identical. The claims of the '155 patent are as follows:

1. A process for incorporating at least one electronic element in the manufacture of a plastic card, comprising the steps of:

(a) providing first and second plastic core sheets;

(b) positioning said at least one electronic element in the absence of a non-electronic carrier directly between said first and second plastic core sheets to form a core, said plastic core sheets defining a pair of inner and outer surfaces of said core;

(c) positioning said core in a laminator apparatus, and subjecting said core to a heat and pressure cycle, said heat and pressure cycle comprising the steps of:

(i) heating said core for a first period of time;

(ii) applying a first pressure to said core for a second period of time such that said at least one electronic element is encapsulated by said core;

(iii) cooling said core while applying a second pressure to said core,

(d) applying a layer of overlamine film to at least one of said outer surfaces of said core.

2. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said laminator apparatus has first and second laminating plates, at least one of said first and second laminating plates having a matte finish for creating a textured surface on at least one of said outer surfaces of said core.

3. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 2, wherein each of said first and second laminating plates has a matte finish for creating said textured surface on both of said outer surfaces of said core.

4. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said first and second plastic core sheets are made from a material selected from the group consisting of polyvinyl chloride, polyester, and acrylonitrile-butadiene-styrene, each of said sheets having a thickness in the range of 0.007 to 0.024 inch.

5. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 4, wherein said first and second plastic core sheets have a thickness of approximately 0.0125 inch.

6. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said second pressure is greater than said first pressure.

7. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 6, wherein said second pressure is at least approximately 25% greater than said first pressure.

8. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said core is heated in step (c)(i) to a temperature in the range of 275.degree. F. to 400.degree. F. and said first period of time is at least five (5) minutes.

9. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said first pressure is approximately 1000 p.s.i. and said second period of time is at least 10 minutes.

10. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said step (d) of applying a layer of overlamine film comprises the further steps of:

(a) positioning an overlamine film on at least one surface of said core;

(b) subjecting said core to a second heat and pressure cycle comprising the steps of:

(i) heating said core to a temperature between approximately 175.degree. F. to 300.degree. F. for approximately 10 to 25 minutes;

(ii) applying approximately 1000 p.s.i. pressure to said core, and

(iii) cooling said core to a temperature in the range of approximately 40.degree. F. to 65.degree. F. for approximately 10 to 25 minutes.

11. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said at least one electronic element is a micro-chip and an associated wire antenna.

12. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said at least one electronic element is a micro-chip and an associated circuit board antenna.

13. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said at least one electronic element is a read/write integrated chip and an associated antenna.

14. A plastic card constructed in accordance with claim 1.

15. A hot lamination process for the manufacture of plastic cards, said process comprising the steps of:

(a) providing first and second plastic core sheets;

(b) positioning at least one electronic element in the absence of a non-electronic carrier directly between said first and second plastic core sheets to form a layered core;

(c) positioning said core in a laminator apparatus, and subjecting said core

to a heat and pressure cycle, said heat and pressure cycle comprising the steps of:

(i) heating said core in said laminator, in the presence of a minimal first ram pressure, to a temperature which causes controlled flow of said plastic which makes up said first and second plastic core sheets;

(ii) applying a second pressure uniformly across said core for encapsulating said at least one electronic element within said controlled flow plastic;

(iii) subsequently cooling said core in conjunction with the concurrent application of a third pressure uniformly across said core, said core including and upper and lower surfaces.

16. The method as recited in claim 15 wherein said first and second core layers are devoid of any appreciable cutouts.

#### **1. Prosecution History**

The '155 patent was filed with 22 claims, two of which were independent. Claims 20-22 were withdrawn subject to a restriction requirement. The PTO issued a first Office Action on September 27, 1999, in which the Examiner held claims 1-19 unpatentable over the '207 patent. On March 24, 2000, the patentee filed a response in which claims 6, 9, 10, 13, 14, and 19 were cancelled, claims 1-5, 7-8, 11-12, 15-18 were amended, and claims 22-24 were added.

In the remarks, Leighton argued that the '207 patent was not available as prior art against the claims because it was a continuation of the '207 patent.

On June 6, 2000, the PTO mailed a Notice of Allowance. The response for allowance indicated that "none of the prior art of record teach the method as claimed



particularly the application of separate heating in two or three pressure steps as applied to the encapsulation of electronic devices.”

## 2. Obviousness of the ‘155 Patent

The record reflects that the ‘105 patent issued due to the recitation of a lamination technique involving a heat and pressure cycle including three specific temperature/pressure periods. As set forth below, the references cited herein include these features and establish the *prima facie* obviousness of the claims. None of these references were reviewed by the USPTO during the examination of the ‘155 patent. Moreover, the record does not reflect substantial evidence of non-obviousness to rebut this conclusion.

We believe that the evidence is clear and convincing that claims 1-13 and 15-16 of the ‘155 patent are invalid for the same reasons as set forth with respect to claims 1-9 and 12-17, respectively of the ‘207 patent. The only difference between these claims is that independent claim 1 of the ‘207 patent contains the limitation “coating at least one of said outer surface of said core with a layer of ink” and independent claim 16 of the ‘207 patent includes the limitation “printing on at least one said upper and lower surfaces of said core such that a layer of ink is applied to at least a portion of said at least one upper and lower surface of said core.” This language difference has no patentable significance.

Independent claims 1 and 15 do not contain these limitations.

Dependent claim 14 of the ‘155 patent does not have a counterpart in the ‘207 patent. Nevertheless, it is a product-by-process claim reciting a plastic card constructed in

accordance with the method of claim 1. This claim is invalid for the same reasons as claim 1.

**C. The '099 Patent**

The '099 patent is a continuation in part of the '207 patent. The '099 patent includes subject matter not originally disclosed in the '207 patent. This subject matter relates to adapting the method set forth in the '207 patent for the production of dual use smart cards. In particular, the '099 patent includes steps for inserting a dual use microchip after lamination. The microchip is functional in both a "contact card" environment and a "contactless" card environment.

The '099 patent contains 18 claims. The claims are similar to those of the '207 and '155 patents. Pursuant to your instructions, we have only considered claims 1-16.

Claims 1-16 are set forth as follows:

1. A process for incorporating at least one electronic element in the manufacture of a plastic card, comprising the steps of:

(a) providing first and second plastic core sheets;

(b) positioning said at least one electronic element in the absence of a non-electronic carrier directly between said first and second plastic core sheets to form a core, said plastic core sheets defining a pair of inner and outer surfaces of said core;

(c) positioning said core in a laminator apparatus, and subjecting said core to a heat and pressure cycle; said heat and pressure cycle comprising the steps of:

(i) heating said core for a first period of time;

(ii) applying a first pressure to said core for a second period of time such that said at least one electronic element is encapsulated by said core;

(iii) cooling said core while applying a second pressure to said core;

(d) coating at least one of said outer surfaces of said core with a layer of ink;

(e) milling a region of said core to a controlled depth so as to form a cavity which exposes at least one contact pad of said electronic element.

2. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said laminator apparatus has first and second laminating plates, at least one of said first and second laminating plates having a matte finish for creating a textured surface on at least one of said outer surfaces of said core.

3. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 2, wherein each of said first and second laminating plates has a matte finish for creating said textured surface on both of said outer surfaces of said core.

4. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said first and second plastic core sheets are made from a material selected from the group consisting of polyvinyl chloride, polyester, and acrylonitrile-butadiene-styrene, each of said sheets having a thickness in the range of 0.007 to 0.024 inch.

5. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 5, wherein said first and second plastic core sheets have a thickness of approximately 0.0125 inch.

6. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said second pressure is greater than said first pressure.

7. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 6, wherein said

second pressure ranges from about 10% to about 40% greater than said first pressure.

8. A hot lamination process as recited in claim 1 having a further step following step (d), said step comprising: positioning said core in a laminator apparatus with a layer of overlamine film on at least one of said upper and lower surfaces of said core and laminating said layer of overlamine film to said core in said laminator to thereby form a sheet of plastic card stock.

9. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said core is heated in step (c)(i) to a temperature in the range of 275.degree. F. to 400.degree. F. and said first period of time is at least five (5) minutes.

10. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said first pressure is approximately 450 p.s.i. and said second period of time is at least 10 minutes.

11. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said step (d) is carried out utilizing a printing press.

12. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said step (d) is carried out utilizing a coating technique selected from the group consisting of silk screen printing, offset printing, letterpress printing, screen printing, roller coating, spray printing and litho-printing.

13. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said step (e) of applying a layer of overlamine film comprises the further steps of:

(a) positioning an overlamine film on at least one ink coated surface of said core;

(b) subjecting said core to a second heat and pressure cycle comprising the steps of:

(i) heating said core to a temperature between approximately

175.degree. F. to 300.degree. F. for approximately 10 to 25 minutes;

(ii) applying approximately 1000 p.s.i. pressure to said core; and

(iii) cooling said core to a temperature in the range of approximately 40.degree. F. to 65.degree. F. for approximately 10 to 25 minutes.

14. A hot lamination process is recited in claim 1 comprising the further step of inserting an electronic contact element into said cavity.

15. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said at least one electronic element is a micro-chip and an associated circuit board antenna or an associated wire antenna.

16. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said at least one electronic element is a read/write integrated chip and an associated antenna.

# **1. Prosecution History of the '099 Patent**

The application resulting in the '099 patent was filed on August 19, 1997 with 24 claims. Three claims were independent. On November 18, 1998, the Patent Office mailed the first Office Action rejecting all claims.

Claims 1-2, 5-9, 11-17 and 20-24 were rejected under 35 U.S.C. §103 as being unpatentable over the Hagairi-Tehrani patent, in view of U.S. Patent No. 3,994,225. Claims 3-4 were rejected under 35 U.S.C. §103 as being unpatentable over the Hagairi-Tehrani patent, in view of the 3,984,225 patent, and further in view of U.S. Patent No. 4,841,134. Claims 18-19 were rejected under 35 U.S.C. §103(a) as being unpatentable over the '024 patent, in view of the 3,994,225 patent, and further in view of U.S. Patent No. 5,809,633.

On March 15, 1999, Leighton responded to the first Office Action. Claims 2, 7, 10, 20, 23, 24 were deleted and claims 1-2, 4-6, 8-9, 12-16, 18-19 and 21 were amended.

Many of the amendments were formal in nature. There were two substantive amendments. Independent claim 1 was amended to recite "positioning said at least one electronic element in the absence of a non-electronic carrier directly between said first and second plastic core sheets [emphasis added]." Claim 1 was also amended to recite "subjecting said core to a heat and pressure cycle" including heating for "first period of time", "applying a first pressure for a second period of time", and "cooling said core and applying a second pressure".

As in the '207 prosecution history, Leighton argued that the claims were distinct from the prior art, because the prior art requires that the "electronic element be placed in a protective carrier disk (6)", whereas the claims recite the "absence of a non-electronic carrier". Further, Leighton argued that the prior art described forming a card by varying pressure and temperature in general, but did not disclose "a sequence of steps or the duration of steps which might be used to encapsulate an electronic element by a plastic card."

On April 12, 1999, the Patent Office mailed a Notice of Allowability. The Examiner's reasons for allowance specified that no prior art or combination of art, included the limitation of the electronic unit being placed directly between plastic sheets.

On May 18, 1999, Leighton filed an amendment after allowance. The Examiner did not enter the amendment because it broadened the scope of the claims and therefore would require further consideration.

On July 8, 1999, Leighton filed a second amendment after allowance to correct an inconsistency in the drawings. The Examiner entered this Amendment on November 4, 1999. On July 8, 1999 Leighton paid the issue fee and the patent issued.

## 2. Obviousness of the '099 Patent

We do not know the date of invention of the '099 patent invention. The earliest priority application listed on the face of the patent is provisional application 60/005,685, which was filed on October 17, 1995. All the references cited herein are prior art with respect to the '099 patent assuming it has an October 17, 1995 effective filing date.

The record reflects that the '099 patent issued due to the inclusion of the negative limitation "in the absence of a non-electronic carrier between said first and second plastic core sheets". As set forth below, the references cited herein include these features and establish the *prima facie* obviousness of the claims. None of these references were considered by the USPTO during the examination of the '099 patent. Moreover, the record does not contain substantial evidence of non-obviousness to rebut this conclusion.

Independent claim 1 of the '099 patent is identical to claim 1 of the '207 patent with one exception. Independent claim 1 of the '099 patent includes the step of "milling a region of said core to a controlled depth to form a cavity which exposes at least one contact pad of said electronic element". We believe that independent claim 1 of the '099 patent is invalid for the same reasons as given with respect to claim 1 of the '207 patent, in addition to the following:

The Japanese application does not explicitly disclose "milling a region of said core to a controlled depth so as to form a cavity which exposes at least one contact pad of said



electronic element.” The Templeton patent, however, establishes that at the time of filing, it was well known in the art to connect two or more components of a smart card by forming holes extending between the electrical contact of components (column 2, lines 26-33; column 7, lines 6-13). The Templeton patent lists milling as a typical way by which these holes are formed. (column 7, line 13-16). It would have been obvious to one of ordinary skill in the art to mill a region of the core of the Japanese application to a controlled depth in order to expose a contact pad of the IC module or antenna 12 thereby insuring that good electrical contacts were formed between the IC module 11 and antenna 12.

The remaining claims are dependent and recite additional limitations that are identical to those of dependent claims in the ‘207 and ‘155 patents. We believe the evidence is clear and convincing that the dependent claims are invalid for the same reasons as set forth above regarding the dependent claims of the ‘207 patent.

Nevertheless, due to slight differences in the order of the dependent claims, we will address each claim in turn.

Regarding claims 2-3, the Japanese application does not explicitly disclose using lamination plates having a matte finish to laminate a smart card. The EP application, however, establishes that it was well known in the art, at the time of filing, to use embossing plates for lamination (page 6, lines 27-30). One of ordinary skill in the art would be motivated to use embossing plates, of which a matte finish is an example, in the method of the Japanese patent to provide the resulting card with a distinctive appearance.

Regarding claims 4-5, the films 14, 14’ disclosed by the Japanese application are made of polyvinylchloride (¶ 8). The Japanese application does not explicitly disclose

using sheets having a thickness of .007-.024 inch, or specifically, .0125 of an inch. Nevertheless, the Lyszczarz patent discloses that it was well known in the art, at the time of filing, to make credit cards with a substrate having a thickness of .0265 inch. It is reasonable to infer that a substrate of .0265 inch can be formed by multiple sheets of PVC having a thickness equal to a fraction of the thickness of the substrate. For example a substrate of .0265 inch can be formed of two sheets equal of .01325 inch. Unless there is evidence to the contrary, changes of size or proportion are *per se* obvious. There is no evidence of record in the '207 patent or file history to suggest that the sheet thickness found in the claims are critical. Therefore, the additional limitations of claims 4-5 are obvious.

Regarding claims 6-7, elementary Physics (Hooke's Law) dictates that the force exerted by a spring is directly proportional to the distance that it is compressed. Springs 24 are used to exert force on plates 13-13' in order to compress the material therebetween. In the Vogt patent, springs 24 are at equilibrium at 6 mm. During heating, springs 24 are compressed to 3 mm. (Column 8, lines 18-31). Then, during cooling, springs 24 are compressed, a further 3 mms. (Column 8, lines 32-36). Thus, springs 24 exert at least 50% more force on plates 13-13' during cooling than in the proceeding heating and compression step. Although claim 7 specifies a specific range of a second pressure being greater 10% to about 40% greater than the first pressure, there is no evidence of record to suggest that this range is critical. Providing a second pressure that is about 10% to about 40% greater than the first pressure would require routine

optimization within the prior art conditions set forth in the Vogt patent and is therefore obvious.

Referring to claim 8, the Lyszczarz patent discloses overlaminating after printing. (Column 4, lines 5-27). It would have been obvious to one of ordinary skill in the art to over laminate after printing in order to protect the printing from damage.

Referring to claim 9, changes in temperature are obvious unless it is shown that the temperature is critical. The '533 patent discloses that a lamination temperature of 265 degrees is known in the art. (Column 4, line 8). There is no evidence of record to suggest the range of 275 degrees to 400 degrees is critical. Further, providing heat for at least five minutes would require routine optimization within prior art conditions and therefore is also obvious.

Regarding claim 10, there is no evidence of record to suggest that a first pressure of 450 p.s.i. and a second pressure of at least 10 minutes is critical. Therefore, performing this step would require routine optimization within prior art conditions and is therefore obvious.

Regarding claims 11-12, the '533 patent discloses printing using offset printing (column 3, line 63), which necessarily utilizes a printing press.

Regarding claim 13, the overlamination process is a substantial repeat of the lamination process. The '533 patent discloses overlaminating after printing. (column 4, lines 25-27). It would have been obvious of one of ordinary skill in the art at the time of filing to use the same procedure for overlaminating as for laminating.

Regarding claim 14, the Templeton patent discloses inserting an electronic contact element into a cavity formed by milling. (Column 7, lines 45-59).

Regarding claim 15-16, the Japanese application discloses embedding an IC module antenna in a plastic card (¶6). One of ordinary skill in the art would have recognized the microchips and antennas of claims 13-15 as potential embodiments of an IC module and antenna. Therefore, the limitations of claims 13-15 would have been obvious.

#### **D. The '367 Patent**

The '367 patent is a continuation of the '099 patent. Apart from the differences to the claims which will be discussed herein, the patents are identical. The claims in the '367 patent are as follows:

1. A process for incorporating at least one electronic element in the manufacture of a plastic card, comprising the steps of:

(a) providing first and second plastic core sheets:

(b) positioning said at least one electronic element in the absence of a non-electronic carrier directly between said first and second plastic core sheets to form a core, said plastic core sheets defining a pair of inner and outer surfaces of said core;

(c) positioning said core in a laminator apparatus, and subjecting said core to a heat and pressure cycle, said heat and pressure cycle comprising the steps of:

(i) heating said core for a first period of time;

(ii) applying a first pressure to said core for a second period of time such that said at least one electronic element is encapsulated by said core;

(iii) cooling said core while applying a second pressure to said core, the second pressure being at least 10% greater than the first pressure; and

(d) milling a region of said core to a controlled depth so as to form a cavity which exposes at least one contact pad of said at least one electronic element.

2. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said laminator apparatus has first and second laminating plates, at least one of said first and second laminating plates having a matte finish for creating a textured surface on at least one of said outer surfaces of said core.

3. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 2, wherein each of said first and second laminating plates has a matte finish for creating said textured surface on both of said outer surfaces of said core.

4. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said first and second plastic core sheets are made from a material selected from the group consisting of polyvinyl chloride, polyester, and acrylonitrile-butadiene-styrene, each of said sheets having a thickness in the range of 0.007 to 0.024 inch.

5. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 4, wherein said first and second plastic core sheets have a thickness of approximately 0.0125 inch.

6. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said second pressure ranges from about 10% to about 40% greater than said first pressure.

7. A process as recited in claim 1 having a further step following step(c), said step comprising: positioning a layer of overlamine film on at least one of said surfaces of said core, positioning said overlamine film and said core in a laminator apparatus and laminating said layer of overlamine film to said core in said laminator to thereby form a sheet of plastic card stock.

8. The process of claim 7, further comprising the step of coating said at least one surface of said core with a layer of ink prior to positioning said overlamine film on said at least one surface of said core.

9. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said core is heated in step (c)(i) to a temperature in the range of 275.degree. F. to 400.degree. F. and said first period of time is at least five (5) minutes.

10. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said first pressure is approximately 450 p.s.i. and said second period of time is at least 10 minutes.

11. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein a coating step is carried out on at least one surface of said core utilizing a printing press.

12. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein a coating step is carried out on at least one surface of said core utilizing a coating technique selected from the group consisting of silk screen printing, offset printing, letterpress printing, screen printing, roller coating, spray printing, and litho-printing.

13. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, having a further step after said step (c) comprising:

(a) positioning an overlamine film on said at least one surface of said core;

(b) subjecting said core to a heat and pressure cycle comprising the steps of:

(i) heating said core to a temperature between approximately 175.degree. F. to 300.degree. F. for approximately 10 to 25 minutes;

(ii) applying approximately 1000 p.s.i. pressure to said core; and

(iii) cooling said core to a temperature in the range of approximately 40.degree. F. to 65.degree. F. for approximately 10 to 25 minutes.

14. The process of claim 13, further comprising the step of coating said at least one surface of said core with a layer of ink prior to positioning said overlamine film on said at least one surface of said core.

15. A process as recited in claim 1 comprising the further step of inserting a second electronic element into said cavity, the second electronic element being in electrical communication with the at least one electronic element.

16. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said at least one electronic element is a micro-chip and an associated circuit board antenna or an associated wire antenna.

17. The process for incorporating at least one electronic element in the manufacture of a plastic card as recited in claim 1, wherein said at least one electronic element is a read/write integrated chip and an associated antenna.

18. The process according to claim 1, wherein the pressure on said core in step (c)(i) is less than 10 p.s.i.

19. The process according to claim 1, wherein said core is heated in step (c)(ii).

20. A process for incorporating at least one electronic element in the manufacture of a plastic card, comprising the steps of:

(a) providing first and second plastic core sheets;

(b) positioning said at least one electronic element in the absence of a non-electronic carrier directly between said first and second plastic core sheets to form a core, said plastic core sheets defining a pair of inner and outer surfaces of said core;

(c) positioning said core in a laminator apparatus, and subjecting said core to a heat and pressure cycle, said heat and pressure cycle comprising the steps of:



- (i) heating said core for a first period of time;
- (ii) applying a first pressure to said core for a second period of time such that said at least one electronic element is encapsulated by said core;
- (iii) cooling said core while applying a second pressure to said core, the second pressure being at least 10% greater than the first pressure.

21. The process according to claims 20, further comprising:

forming a cavity in said core.

22. The process according to claim 21, wherein the step of forming a cavity in said core comprises:

after step (c), milling a region of said core to a controlled depth so as to form a cavity which exposes at least one contact pad of said at least one electronic element.

23. The process according to claim 22, further comprising:

inserting a second electronic element into said cavity, the second electronic element being in electrical communication with the at least one electronic element.

# 1. **Prosecution History**

The '367 patent was filed on August 5, 1999 with 24 claims. Two claims were independent. On December 6, 2000, the PTO issued a first Office Action. Claims 18-22 were withdrawn subject to an election requirement. Claim 11 was rejected under 35 U.S.C. §101 for statutory double patenting as claiming same invention as claim 1 of the '099 patent. Claims 1-17, 23 and 24 were rejected for obviousness double patenting over claims 1-16 of the '099 patent. Claims 1-17, 23 and 24 were rejected for obviousness double patenting as being unpatentable over claims 1-17 of the '207 patent in view of the Templeton patent. Finally, claims 1, 4-10 and 4-17 were rejected under 35 U.S.C. §103(a)

as being unpatentable over the Japanese application in view of UK Application 2,279,610 and the Templeton patent optionally with the U.K. application. Lastly, claims 2, 3, 11-13 and 23-24 were rejected under 35 U.S.C. §103(a) as being unpatentable over the preceding references, further in view of UK Application 2,294,899.

On July 20, 2001, the USPTO mailed a Notice of Abandonment for failure to file a reply to the preceding Office Action.

On February 15, 2002, Leighton filed a Petition for Revival of a Unintentionally Abandoned application. Leighton also filed an amendment for Request for Reconsideration in which the application was amended to claim priority to the '099 patent and two provisional applications, 60/005,685 and 60/024,255. Leighton made a formal amendment to claim 1, cancelled claim 11, and added new claims 25-30. Leighton filed a Terminal Disclaimer disclaiming any term disclaiming beyond the '099 patent or the '207 patent.

In the remarks Leighton argued that the UK 2,279,610 application was not prior art due to the October 17, 1995 priority date for the provisional application 60/005,685. Further, Leighton argued the UK application does not disclose or suggest a preheating step where minimal pressure is applied.

On May 8, 2002, the Patent Office mailed another Office Action. The Terminal Disclaimer was rejected for not having an authorized representative signing it. Thus, the obviousness double patenting rejections were maintained. New claim 27 was rejected under 35 U.S.C. §103(a) as being unpatentable over the Japanese application, in view of the '610 application and further in view of the UK application. Claims 1, 4-10, 14-17 and

25-29 were rejected under 35 U.S.C. §103(a) as being unpatentable over the Japanese application, in view of the UK 2,279,610 application and the Templeton patent further taken with the UK application. The Examiner responded to the patentee's arguments regarding the UK 2,279,610 application not being prior art by stating that Leighton failed to provide support for the claimed subject matter in the earlier provisional application.

On October 2, 2002, Leighton amended the independent claims to specify that the pressure applied to the core is "at least 10% greater" than the pressure applied during heating. Leighton filed a second Terminal Disclaimer signed by an authorized representative. Leighton argued that the cited references do not teach or suggest increasing "the pressuring during cooling at least 10% greater than the pressure applied during heating".

On October 9, 2002, the patentee's attorney conducted an interview with the Examiner to discuss formal amendments that were necessary to the claims. On or about October 9, 2002, the PTO mailed a Notice of Allowability including an Examiner's amendment to correct the aforementioned informalities. In the reasons for allowance, the Examiner, apparently unaware of the Vogt patent, stated that the prior art did not teach or suggest applying a second pressure upon the assembly during cooling wherein "the second pressure was 10% greater than the pressure applied during assembly and heating."

On December 12, 2002, the patentee paid the issue fee and the patent issued on February 4, 2003.

## 2. Obviousness of the '367 Patent

In our opinion there is clear and convincing evidence that the claims of the '367 patent are invalid under 35 U.S.C. § 103 as obvious. The record reflects that the critical feature resulting in the allowability of the '367 patent was the inclusion in the independent claims of the limitation that the pressure during cooling was 10 % greater than the pressure during heating. As set forth below, the Vogt patent not only includes this feature but was also not considered by the Examiner during the examination of the '367 patent application. Application of the Vogt patent in combination with the other references cited herein establishes the *prima facie* obviousness of the claims of the '367 patent. Moreover, the record does not contain substantial evidence of non-obviousness to rebut this conclusion.

The claims of the '367 patent are virtually identical to the claims we have already discussed with respect to the other Leighton patents. The main difference is that the independent claims of the '367 patent specify that the cooling step is conducted under pressure of at least 10% greater than the pressure applied during heating. However, as we discussed above on pages 16-17 of this opinion, the Vogt patent discloses cooling under a pressure that is approximately 50% greater than the pressure exerted during heating. Thus, the 10% limitation imparts no patentability to the claims of the '367 patent.

Claim 1 of the '367 patent is identical to claim 1 of the '099 patent except that it includes the 10% limitation and does not include the step of coating the substrate with ink prior to lamination. The Vogt patent discloses applying pressure during cooling that is at least 10% greater than the pressure applied during the preceding heating step. Therefore,

claim 1 of the '367 patent would have been obvious for this reason and the reasons given with respect to claim 1 of the '099 patent.

Claims 2-7 of the '367 patent include additional limitations that are identical to the limitations set forth in claims 2-8 of the '099 patent and are invalid for the same reasons.

Claims 9-13 of the '367 patent include limitations identical to claims 9-13 of the '099 patent and are invalid for the same reasons.

Claims 15-17 contain limitations similar to the limitation in claims 14-16 of the '099 patent and are invalid for the same reasons.

Claims 8 and 14 of the '367 patent merely add the limitation "coating said at least one surface of said core with a layer of ink prior to positioning said overlaminant film on said at least one surface of said core." As we have established, this was well known in the art ('533 patent, column 4, lines 14-27) and one of ordinary skill in the art would have been motivated to coat the core with ink prior to lamination because providing a credit card, of which a smart card is an example, with printed information is necessary for commercialization.

Dependent claim 18 of the '367 patent merely specifies that the pressure on the core during the preheating step is less than 10 p.s.i. We have established that the UK application demonstrates that it was well known in the art at the time of filing to preheat a lamination press for a first period of time followed by applying pressure for a second period of time. (Page 11, lines 1-14). Thus, one of ordinary skill in the art would have included a preheating step with no pressure because to do so conformed with standard industry practice.

Dependent claim 19 merely adds the limitation that the core is heated while pressure is applied for a second period of time. The UK application discloses that it was well known to apply heating while exerting pressure. (Page 11, lines 10-14).

Independent claim 20 is broader than independent claim 1 and it does not contain a step related to milling to form a cavity. Nevertheless, all the steps have been shown to be disclosed by the prior art. Therefore, claim 20 is invalid.

Claims 21-22 recite forming a cavity and forming a cavity through milling respectively. Therefore, these claims are invalid for the same reasons with respect to independent claim 1.

Finally, dependent claim 23 merely recites inserting an electronic element to the cavity. The Templeton patent discloses inserting an electronic contact element into a cavity formed by milling. (Column 7, lines 45-59).

Regarding claim 15-16, the Japanese application discloses embedding an IC module antenna in a plastic card (¶16). One of ordinary skill in the art would have recognized that the microchips and antennas of claims 13-15 as potential embodiments of an IC module and antenna. Therefore, the limitations of claims 13-15 are obvious.

## **VII. Conclusion**

Based on the foregoing, our conclusion is that the claims of the Leighton patents are invalid under 35 U.S.C. § 103(a). There may be other reasons why these claims are invalid, but we have not had the opportunity to consider all of the prior art.



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It is possible that Leighton would disagree with our opinion. Based on the above analysis we believe that Leighton would be unsuccessful in a lawsuit, but because of the uncertainties of litigation we cannot ensure that result.

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Sincerely yours,

SEYFARTH SHAW LLP

A handwritten signature in black ink, appearing to be "G. Gerstman".  
George H. Gerstman

GHG:cp  
Enclosures